MEMORANDUM OF UNDERSTANDING
ON COOPERATION IN RESEARCH
TO PROTECT HUMAN HEALTH AND THE ENVIRONMENT

between the

U.S. DEPARTMENT OF ENERGY

and the

U.S. ENVIRONMENTAL PROTECTION AGENCY

Whereas, the missions of the U.S. Department of Energy (DOE) and the U.S. Environmental Protection Agency (EPA) include research and development (R&D) to improve the scientific foundation for environment, energy and public health policy decisions;

Whereas, DOE and EPA are both scientific leaders and have large scientific and technical capabilities and facilities;

Whereas, DOE and EPA recognize the importance of basic and applied research and technology development in supporting the economy and protecting the environment and security of the United States;

Whereas, both agencies have collaborated successfully on a variety of basic and applied research and technology issues, and are convinced of the importance of furthering this collaboration to leverage each other's expertise;

Whereas, the Secretary of Energy and the Administrator of EPA believe that a formal memorandum will provide the structure and basis for implementing and expanding joint research and for developing and applying this research to achieve innovative, cost-effective and demonstrable results in the environmental and energy fields;

DOE and EPA agree to the following memorandum of understanding (MOU):

I. PARTIES

This document constitutes an agreement between DOE and EPA to collaborate on the conduct of R&D, utilization and dissemination of science results to support the missions of both agencies,

particularly where benefits to the public and the environment would arise from joint activities. Each agency's contributions will be acknowledged as appropriate in all publications, press releases, etc., resulting from joint activities.

II. AUTHORITIES

The mission of DOE includes: fostering a secure and reliable energy system that is environmentally and economically sustainable; being a responsible steward of the Nation's nuclear weapons; cleaning up the Department's facilities; leading in the physical sciences and advancing the biological, environmental, and computational sciences; and providing premier scientific instruments for the Nation's research enterprise. DOE has broad authorities for the conduct of research and the furtherance of science under the Atomic Energy Act of 1954, the Department of Energy Organization Act (42 U.S.C. 7101 et seq.), the Energy Reorganization Act of 1974, and other statutes.

The mission of EPA is to protect human health and to safeguard the natural environment—air, water, and land—upon which life depends. EPA has broad, multiple authorities for environmental research and science from the Clean Air Act, the Solid Waste Disposal Act, the Food Quality Protection Act, the Safe Drinking Water Act, and other statutes. EPA risk assessments of environmental pollutants and stressors provide the scientific basis not only for the United States, but for other nations as well.

III. PURPOSE

The purpose of this MOU is to expand the research collaboration of both agencies in the conduct of basic and applied research related to: (1) environmental protection, environment and energy technology, sustainable energy use, ecological monitoring, material flows, and environmental and facilities clean-up; (2) high-performance computing and modeling; and (3) emerging scientific opportunities in genomics, nanotechnology, remote sensing, bioinformatics, land restoration, material sciences, molecular profiling, and information technology, as well as other areas providing promising opportunities for future joint efforts by EPA's and DOE's research communities.

The parties agree that their mutual goal is to promote and conduct research that results in high-quality products that strengthen environmental health through their use by federal agencies, States, Native American Tribes, and the public. The parties also agree that the independence and objectivity of EPA and DOE research is a valuable asset to both agencies.

With this stated goal, this MOU identifies the following, long-term joint research and science communication objectives:

A. Collaborate on the development and implementation of sensing, data collection, and information synthesis for measuring and tracking the state of the environment;

B. Collaborate on the development and adoption of cleaner energy and energy efficiency technologies;

C. Collaborate on the development of data, tools, and analyses relating to the flow of materials through the economy;

D. Collaborate on research in pollution prevention, green engineering, and green chemistry;

E. Collaborate on the development of a cross-agency network of computing and environmental science expertise to build upon the expertise of federal agencies and develop improved means for communication and collaboration;

F. Collaborate on the development and application of high-performance computing to enhance environmental science and modeling;

G. Explore approaches for scientific information sharing and dissemination;

H. Explore the use of new technology sensors, nanotechnology, visualization, etc. to provide better understanding of human health and the environment; and

I. Pilot, develop, and apply computational toxicology as means of using genetics, molecular profiling, and computing to reduce animal testing and improve the quality and timeliness of toxicity information of chemicals.

Both parties recognize the benefit of coordinating their respective research efforts. This MOU lays the foundation for a broader, co-sponsored program that would improve efficiencies and avoid redundant research activities and products, through leveraging resources and capabilities within each agency.

IV. LIMITATIONS

A. All commitments made in this MOU are subject to the availability of appropriated funds and each agency's budget priorities. This MOU is neither a fiscal nor funds obligation document. Nothing in this MOU authorizes or is intended to obligate the parties to expend, exchange, or reimburse funds, services, or supplies, or transfer or receive anything of value, or to enter into any contract, assistance agreement, interagency agreement, or other financial obligation. Any endeavor

involving reimbursement or contribution of funds between the parties to this MOU will be handled in accordance with applicable laws, regulations, and procedures, and will be subject to separate subsidiary agreements that will be effected in writing by representatives of both parties.

B. This MOU in no way restricts either of the parties from participating in any activity with other public or private agencies, organizations, or individuals.

C. This MOU does not direct or apply to any person outside DOE and EPA. It is strictly for internal management purposes for each of the parties. This MOU is not legally enforceable and shall not be construed to create any legal obligation on the part of either party. This MOU shall not be construed to provide a private right, benefit, or cause of action for or by any person or entity enforceable by law or equity against DOE or EPA, their officers, or employees, or any other person.

D. As a result of this MOU, neither DOE nor EPA may endorse the purchase or sale of products and services provided by private companies that participate in commercialization efforts.

E. DOE and EPA will provide mutual support in budget justification to OMB and hearings before the Congress with respect to programs on which the organizations collaborate.

V. RESPONSIBILITIES OF THE PARTIES

Both parties agree to:

A. Meet once a year to review progress under this MOU and to update the joint plans for meeting its objectives. EPA and DOE will alternately take the lead in setting up these meetings and will involve the appropriate parties across both organizations;

B Encourage the development and ultimate commercialization of technologies resulting from their joint research;

C. Jointly work to transfer the relevant products, information, and tools that are needed to support environmental decision making to interested federal agency officials, State, Tribal, and local institutions and the public, providing for technical assistance as appropriate; and

D. Jointly explore broadening their collaboration on computation and environmental research to include other agency partners.

Specific initial collaborative projects and actions are defined in Appendix 1.

VI. PROPRIETARY INFORMATION AND INTELLECTUAL PROPERTY

Joint work under this MOU requires the sharing of proprietary information. Proprietary information is defined as information that an affected business claims to be confidential, is exempt from mandatory disclosure under applicable federal law, and is not otherwise available to the public. Proprietary information disclosed by one party to the other in writing must be clearly defined as such; proprietary information initially disclosed orally must be clearly memorialized in writing within a reasonable time for the receiving party. To the extent allowed by law, the parties agree to keep proprietary information confidential unless written permission is obtained from the affected business.

Neither party claims by virtue of this agreement any legal interest in existing or pending intellectual property—patent, copyright, trademark, or trade secret—of the other party or in any intellectual property that might result from the other party's previous activities. Rights to intellectual property arising from education and research programs undertaken in furtherance of this MOU will be allocated according to the law and practices and the policies of the parties.

VII. PERIOD OF AGREEMENT

This MOU will be effective when signed by both parties. This MOU may be amended at any time by the mutual written consent of the parties. The parties will review this MOU at least once every five years to determine whether it should be revised, renewed, or canceled. Either party may terminate this agreement by providing 90 days' written notice to the other party. This MOU does not involve the exchange of funds nor establish any obligation on the part of either party to make payment now or in the future to the other party.

This MOU constitutes the entire agreement between the parties for its stated purpose, and no modification or addition will be valid unless signed by the parties and appended to this agreement. Any terms of this MOU found to be inconsistent with current DOE or EPA directives or policies will be invalid, but the remaining terms will remain in effect. Notices and other official communications between the parties will be considered as delivered if hand delivered or if posted as registered U.S. mail.

Signed on behalf of

U.S. Department of Energy	**U.S. Environmental Protection Agency**
_____	_____
Spencer Abraham, Secretary	**Michael O. Leavitt, Administrator**
_____	_____
Date	**Date**

Appendix I

In the short term, DOE will: (1) produce genomic resources for environmental sentinel organisms to enable genomic approaches for toxicological studies; and (2) collaborate in the development of a cross-agency network of computing and environmental science expertise. These initial efforts will include:

a. Drafting sequence, annotation, and analysis for the genomes of two environmental sentinels: the frog *Xenopus tropicalis* (end of 2004) and the water flea *Daphnia pulex* (end of 2005);

b. Sampling expressed sequence tags and full-length cDNA for Xenopus, Daphnia, and the fathead minnow Pimephales spp., with emphasis on tissues and developmental stages of interest to EPA researchers (end of 2005);

c. Beginning to produce shotgun sequence from environmental samples, including water, soils, etc., to sample organism diversity, detect variation with exposure, and assess progress of remediation efforts;

d. Hosting a joint DOE/EPA workshop at the DOE Joint Genome Institute to address applications of genomic data to the "cascade of events" of EPA interest, focusing on quantitative risk assessment, extrapolations across species, genomic indicators of risks, underlying biological mechanisms, and integrating genomic and phenotypic databases;

e. Collaborating on the development of an inter-agency computational framework to allow shared access of computational resources and manipulation of data and results, facilitate joint execution of experiments and simulations, and conduct joint analysis and visualization of experimental results;

f. Providing access to and expert advice on the use of scientific applications and technology, in the areas of computational toxicology, remote sensing, air quality, homeland security, and informatics. Areas of near-term collaboration include the application of multivariate curve resolution (MCR) methods, airborne instrumentation and imaging sensors, simulation of flow and chemical transport/reaction models, and the application of computer and statistical techniques (e.g., multivariate analysis of massive data sets); and

g. Jointly conducting scientist-to-scientist workshops in common areas of interest (e.g., computational toxicology, remote sensing, air quality, homeland security, and informatics) to facilitate closely linked and integrated projects.

In the short term, EPA will apply the scientific and computing expertise and resources provided by DOE to:

a. Characterize gene regulation and androgen dose and elucidate toxicity pathways in the fathead minnow, Daphnia and Xenopus;

b. Use the these findings to develop short-term endocrine disruption assays for various applications, including materials from DOE remediation efforts;

c. Consult with DOE and its grantees on Xenopus husbandry;

d. Jointly plan and participate in the DOE/EPA workshop at the DOE Joint Genome Institute and to address applications of genomic data to the "cascade of events" of EPA interest, focusing on quantitative risk assessment, extrapolations across species, genomic indicators of risks, underlying biological mechanisms, and integrating genomic and phenotypic databases;

e. Select 3 to 5 pilot projects in the areas of computational toxicology, remote sensing, air quality, homeland security, and informatics, and provide the necessary information, scientific, and resource support needed to successfully test and apply DOE applications and technologies to specific environmental research problems;

f. Develop a collaborative framework for selected pilots that will enable shared access to data and results, joint use of computational applications and visualization tools, and participatory analysis across scientific boundaries; and

g. Jointly conduct scientist-to-scientist workshops in common areas of interest (e.g., computational toxicology, remote sensing, air quality, homeland security, and informatics) to facilitate closely linked and integrated projects.